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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/763,800	01/24/2004	Larry S. Eoff	2003-IP-009464U1	1654
71407	7590	07/17/2008		
ROBERT A. KENT P.O. BOX 1431 DUNCAN, OK 73536			EXAMINER FIGUEROA, JOHN J	
			ART UNIT 1796	PAPER NUMBER
			NOTIFICATION DATE 07/17/2008	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/763,800	Applicant(s) EOFF ET AL.	
	Examiner John J. Figueroa	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 March 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) See Continuation Sheet is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-5,10-14,21,24-29,127,130-132,137-141,144,145 and 147 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>See Continuation Sheet</u> . | 6) <input type="checkbox"/> Other: _____ |

Continuation of Disposition of Claims: Claims pending in the application are 1,3-5,10-14,21,24-29, 100-106; 111-127, 130-145, 147, 149-151 and 155-157.

Continuation of Disposition of Claims: Claims withdrawn from consideration are 100-106,111-126,133-136,142,143,149-151 and 155-157.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :3/12/08; 4/22/08; 6/05/08 & 6/27/08.

DETAILED ACTION

Response to Amendment

1. The 35 U.S.C. 103(a) rejection of claims 1, 3-5, 10-14, 21, 24-29, 100-106, 109-127, 130-145, 147 and 149-154 as unpatentable over United States Patent Number (USPN) 3,271,307 to Dickson et al. (hereinafter 'Dickson') in view of USPN 4,532,052 to Weaver et al. (hereinafter 'Weaver') previously made of record in item on page 3 of the Office Action mailed January 14, 2008 (hereinafter 'RCEOA') has been withdrawn in favor of the new grounds of rejection set forth below.
2. The indication of chitosan as an allowable species for the hydrophobically-modified water-soluble polymer previously made of record in item 5 of the Final Office Action of July 24, 2007 has been withdrawn in view of the new grounds of rejections set forth below.

Election/Restrictions

3. A restriction requirement and an election of species had been previously presented in item 1 on page 2 of the Office Action of March 23, 2006 and in item 3 on page 2 of Office Action of March 5, 2007.
4. Applicant had elected Group I, claims 1-5, 10-14, 21, 24-29 and 99-145 which were drawn to a method of performing an injection operation including introducing a

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relative permeability modifier (RPM) comprising a hydrophobically modified water-soluble polymer, classified in class 507, subclass 110. New claims 146-149 had been included in this group and previously considered.

5. An election of species for the hydrophilic polymer was required (items 7-8 of the Office Action of 3/23/2006) and Applicant had elected, without traverse, "chitosan" as the species to be examined. Further, Applicant has amended independent claim 106 in the current response to RCEOA filed March 25, 2008 (hereinafter 'Response') to limit the hydrophobically modified polymer contain a quaternized amino pendant group.

Accordingly, claims 100-106, 111-126, 133-136, 142,143, 149-151 and 155-157 have been withdrawn from consideration in the instant action as drawn to a non-elected species.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 1 and 127 (and claims 3-5, 10-14, 21, 24-29, 130-132, 137-141, 144, 145 and 147 that depend therefrom) are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Independent claims 1 and 127 have

been amended in Response to recite the polymer having the specified molecular weight limitation "once synthesized". There is insufficient written description support for this limitation in the claims.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 1 and 127 (and claims 3-5, 10-14, 21, 24-29, 130-132, 137-141, 144, 145 and 147 that depend therefrom) are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Independent claims 1 and 127 have been currently amended to limit the claimed polymer to have "a molecular weight ... of about 100,000 to 10,000,000 *once synthesized*" in lines 8 and 6, respectively.

In addition to this limitation having insufficient written description support in the present specification as discussed in the immediately preceding paragraph, it is uncertain from the claim language and the specification as to how this limitation is to be interpreted. This new limitation is unclear as to whether it should be interpreted as the polymer attaining the recited molecular weight in the subterranean formation (that is, the hydrophobically-modified polymer is formed from a hydrophilic polymer and a hydrophobic compound *within* the formation); or, alternatively, as to whether Applicant intended this limitation to limit said polymer to be formed outside the formation and introduced into the formation immediately upon attaining this molecular weight "once synthesized".

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 1, 3-5, 10-14, 21, 24-29, 127, 130-132, 137-141, 144, 145 and 147 are rejected under 35 U.S.C. 102(e) as being anticipated by PCT Application Publication WO 03/056130 A1 to Couillet et al. (hereinafter 'Couillet').

Couillet discloses a method for fracturing/treating a subterranean formation to substantially alter the fluid flow (permeability) and/or surface characteristics of the formation, said method including injecting into the formation an aqueous fracturing viscoelastic composition containing a water-soluble hydrophobically-modified polymer having hydrophobic chains of approximately 12-24 carbons and a molecular weight between 10,000 and 10,000,000 g/mol. (Abstract; page 1, lines 1-24; page. 4, line 10 to page 5. line 22; page 8, lines 26-32; page 11, line 28 to page 12, line 19; page 13, lines 5-9; page 19, lines 18-32; See, e.g., Examples 12-14 disclosing studies of the leak properties (fluid-loss permeability) of sample drilling fluids)

Couillet further discloses that the polymer backbone can be a polysaccharide or a derivative thereof, such as chitin or chitosan, having a molecular weight around 100,000 to 500,000 g/mol; wherein the chitosan can be modified via an acylation reaction (i.e. formed by an alkylation reaction of a chitosan hydrophilic backbone involving an alkali halide, such as an alkyl chloride). (Page 12, line 21 to page 13, line 31; See Example 10 and Figures 15-16 disclosing a drilling fluid comprising from about 1 to 10% modified chitosan having an 11-carbon hydrophobic side chain)

Examiner notes that Couillet discloses chitin, chitosan and modified chitosan via acylation/alkylation with an alkyl halide as a polymer compound added to the formation. (See, instant claims 5 and 6 reciting chitosan and alkyl halide as the hydrophilic polymer and hydrophobic compound, respectively.) Consequently, Couillet is disclosing using in the method of treating a formation a RPM polymer compound as encompassed by the instant claims with "sufficient specificity".

Although Couillet may not expressly disclose "diverting at least a portion of the aqueous injection fluid to another subterranean zone" as recited in independent claim 1, Couillet discloses treating a formation with the same relative permeability modifier (RPM) polymer compound as encompassed by the instant claims and thereby should possess the same physical properties/effects. Accordingly, the RPM used in the method disclosed in Couillet should "divert" a portion of the fluid to another surface of the subterranean formation upon the addition of said RPM polymer compound in Couillet's method of treating/fracturing a formation because said RPM disclosed in Couillet is encompassed by that recited in the instant claims.

Thus, the claims are anticipated by Couillet.

12. Claims 127, 130-132, 137-141, 144, 145 and 147 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent Application Publication No. 2003/0013871 A1 to Mallon et al., hereinafter 'Mallon'.

Mallon discloses preparing a modified cellulose/polysaccharide ether by subjecting the cellulose ether sodium salt to electrodialysis and reacting with a base or salt to form a product that has few impurities and is thereby low polluting; wherein the base or salt can be, e.g., a chloride of up to three carbons; and wherein the polysaccharide starting material can be chitosan or chitin. (Page 1, [0004] to [0008] and [0018]; page 2, [0024]; page 4, [0060]) The molecular weight of the for the polysaccharide is between 10,000 and 2 million grams/mol (page 4, [0061]) and a particular derivatizing agent for modifying the polysaccharide are alkyl halides, such as ethyl chloride or methyl chloride (page 4, [0062]).

Mallon further discloses that a typical industrial application for the polysaccharide ether is in oil field drilling and fracturing processes, wherein the modified polysaccharide can serve as a viscosity adjuster or suspension aid (page 6, [0076]) and wherein said polysaccharide can be present in a composition from about 0.05 to 3% by weight (page 6, [0080]). Accordingly, because Mallon is disclosing adding to a drilling process in a subterranean formation the same compound (alkylated chitosan) as the elected species for the hydrophobically-modified polymer recited in the claims (which would, of course, inherently have the same physical properties), Mallon is thereby disclosing a method of

performing an injection operation in a subterranean formation by adding an RPM polymer compound in accordance with the instant claims with sufficient specificity.

Although Mallon may not explicitly disclose “diverting at least a portion of the aqueous injection fluid” as recited in independent claim 127, because Mallon discloses treating a formation with the same relative permeability modifier (RPM) polymer compound as encompassed by the instant claims (which would possess the same physical properties/effects), then the method of drilling/treatment disclosed in Mallon must inherently “divert a portion of the aqueous injection fluid” to another subterranean formation zone upon the addition of said RPM polymer compound in Mallon’s method of introducing a fluid into a formation.

Thus, the claims are anticipated by Mallon.

Claim Rejections - 35 USC § 103

13. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

14. Claims 1, 3-5, 10-14, 21 and 24-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mallon in view of Couillet.

Mallon was discussed above in the instant action and all the arguments and grounds of rejection therein are incorporated herein in their entirety. Mallon does not expressly disclose “injecting” the fluid into the formation.

However, Couillet teaches that it is routine in the oil field drilling/ treatment fluid art to inject specialized fluids via a well bore into a subterranean formation to, e.g.,

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stimulate hydrocarbon production. (Page 1, lines 15-25) Couillet further teaches that fluids are commonly injected into a formation at sufficient pressures to, e.g., create fractures in the formation rocks by which hydrocarbons may readily flow into the well bore (hydraulic fracturing). (Page 19, line 34 to page 20, line 9)

Therefore, it would have been obvious to one in the art at the time that the claimed invention was made to introduce the drilling/treatment fluid composition disclosed in Mallon into a well bore via an injection technique. It would have been obvious to one skilled in the art to do so because injecting fluids into a well bore is a routine form for delivering a fluid to a subterranean formation surface with sufficient pressure to thereby attain a resultant method of treating/drilling that, *inter alia*, provides enhanced hydrocarbon production as taught by Couillet.

Thus, the instant claims are unpatentable over Mallon and Couillet.

Response to Arguments

The 35 U.S.C. §103 Rejection over Dickson and Weaver (item 5 of RCEOA)

15. Applicant's arguments in Response with respect to the 35 U.S.C. 103(a) rejection as unpatentable over Dickson in view of Weaver have been considered but deemed moot in view of the withdrawal of this rejection in favor of the new grounds of rejection. Neither Dickson nor Weaver discloses the water-soluble hydrophobically-modified polymer to be chitosan.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Particularly, the USPN 7,081,439 B2 to Sullivan is deemed cumulative. USPN 4,814,096 A to Evani and USPN 7,091,159 B2 to Eoff are relevant but are not drawn to the elected species and also deemed cumulative.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John J. Figueroa whose telephone number is (571) 272-8916. The examiner can normally be reached on Monday-Thursday 8:00-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Randy Gulakowski/

Supervisory Patent Examiner, Art Unit 1796